



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/532,907	03/21/2000	Douglas J. Holmi	02103-36601	6793
26161	7590	05/07/2004	EXAMINER	
FISH & RICHARDSON PC 225 FRANKLIN ST BOSTON, MA 02110			GRAHAM, ANDREW R	
		ART UNIT		PAPER NUMBER
		2644		13

DATE MAILED: 05/07/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)
	09/532,907	HOLMI ET AL.
	Examiner Andrew Graham	Art Unit 2644

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1) Responsive to communication(s) filed on 12 January 2004.
 2a) This action is **FINAL**. 2b) This action is non-final.
 3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4) Claim(s) 1-23 and 25-31 is/are pending in the application.
 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
 5) Claim(s) _____ is/are allowed.
 6) Claim(s) 1-23 and 25-31 is/are rejected.
 7) Claim(s) _____ is/are objected to.
 8) Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9) The specification is objected to by the Examiner.
 10) The drawing(s) filed on 16 February 2004 is/are: a) accepted or b) objected to by the Examiner.
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
 11) The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 a) All b) Some * c) None of:
 1. Certified copies of the priority documents have been received.
 2. Certified copies of the priority documents have been received in Application No. _____.
 3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)	4) <input type="checkbox"/> Interview Summary (PTO-413)
2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)	Paper No(s)/Mail Date. _____
3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____	5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)
	6) <input type="checkbox"/> Other: _____

DETAILED ACTION

Drawings

1. The drawings were submitted on February 16, 2004. These drawings are approved by the examiner, and have been entered into the case. However, please see the objection below regarding the content of the drawings.

2. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(4) because reference characters "20" and "22" have been used to designate both angles and speakers between Figures 3A-3C and Figure 6. A proposed drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance. It is further noted that any corrections to the reference characters in the drawings should be reflected by amendments to the specification.

Claim Rejections - 35 USC § 112

3. The amendments made in view of the previous rejection under 35 U.S.C. 112 are acknowledged, and accordingly, said previous rejections are hereby withdrawn.

4. **Claims 4-8** are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Art Unit: 2644

Claim 4 recites the limitation "said automobile seat" in the eighth line of the claim. There is insufficient antecedent basis for this limitation in the claim.

Claims 5-8 are rejected based on their dependency upon Claim 4.

5. **Claims 29-31** are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 29 includes the limitation "a rear behind said first and second front seats". As it is currently claimed, it is unclear as to what the phrase "a rear" is referring. Appropriate correction is required.

Claims 30 and 31 are rejected based on their dependency upon Claim 29.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless -

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

6. **Claims 13-17** are rejected under 35 U.S.C. 102(b) as being anticipated by Boinais et al (FR 2768099 A1). Hereafter, "Boinais et al" will simply be referred to as "Boinais".

Art Unit: 2644

Boinais discloses an arrangement for equipping a vehicle seat with loudspeakers. As can be seen in Figure 1, a standard vehicle seat is shown, comprising a base (2), a back support (3), and a headrest (5). Regarding the language of Claim 13, the overall device reads on "A sitting device" and the back support (3) reads on "a back portion having an upper surface". As is also shown in Figure 1, speakers (8) are mounted in an upward facing manner on the top of the back support (3). Figure 2 illustrates the horizontal relationship between a user's head (6) and the two speakers (8). These speakers and their orientation read on "an electroacoustical transducer, mounted in said upper surface along an axis and oriented to radiate substantially upward from said upper surface". Please see the included translation of this document, particularly the second page, in regards to the details of the components and the reference characters cited in this set of rejections.

Regarding **Claim 14**, the seat illustrated in the Figures of Boinais is specifically a vehicle seat (title of reference, page 1, line 1). This reads on "said sitting device is an automobile seat". Please see the paragraph that begins "Figures 1 and 2".

Regarding **Claim 15**, as mentioned above, Figure 1 clearly illustrates the automobile seat having a headrest (5), which reads on "said automobile seat comprises a headrest". Please see the paragraphs that begin "This seat includes" and "This head-rest.

Regarding **Claim 16**, as is mentioned in regards to Claim 13, Figure 1 illustrates that the back support (3) of the vehicle seat

Art Unit: 2644

includes two transducers (8). This reads on "a second electroacoustical transducer mounted in said upper surface along an axis and oriented to radiate upward from said upper surface". Please see the paragraph that begins "In addition".

Regarding **Claim 17**, Figure 2 clearly illustrates a user's head (6) being positioned between the two speakers (8), which reads on "said first transducer is positioned to the left of a user's normal head position and said second transducer is positioned to the right of said user's normal head position".

7. **Claims 18 and 20** are rejected under 35 U.S.C. 102(b) as being anticipated by Klayman (USPN 4819269).

Klayman discloses a method for improving the perception of sound source imaging in a multi-channel loudspeaker system. Figure 8 illustrates an embodiment of the invention wherein the improvement is applied to the audio system of a vehicle interior. A plurality of passengers are shown (D, P1-P4), each of which are seated in the vehicle, wherein the overall audio system thus reads on "An automobile audio system for an automobile having a passenger compartment having a plurality of seats" (col. 8, lines 35-48 and col. 9, lines 49-57). The audio source applied to the audio system in Figure 8 includes a number of components (10, 12, 14, 18) for deriving a total of three audio signals, including one sum and two difference channel signals (col. 3, lines 16-33 and col. 9, lines 8-48). The multiple channel output of these collective components reads on, "a first audio signal source

Art Unit: 2644

having a plurality of output channels, said plurality of channels including a surround output channel". The difference channels are known in the art as surround channels, and Klayman particularly cites their reverberation simulation qualities, wherein the output sound represents an incoming audio signal from a direction different than that of the original sound source (col. 3, lines 21-33). Each of the passengers (D,P1-P4) is exposed to a similarly positioned, wide diffusion-type speaker (110,120,146) that emits one of the difference signals (col. 7, lines 42-68 and col. 9, lines 4-67). These speakers read on "a plurality of substantially identical electroacoustical transducers for radiating sound waves corresponding to said surround channel". Again, as illustrated in Figure 8, each of these speakers is positioned facing the area in which each of passenger's knees are located when the passengers are in a seated position, and each of these speakers are positioned to the left of this area for each passenger. This reads on "wherein said plurality of electroacoustical transducers are positioned in said passenger compartment such that each of said plurality of seats are positioned substantially identically to, and in the direct field of, one of said plurality of electroacoustical transducers". The reference of Gates (USPN 5129004) has been included with this action to substantiate the position that these difference signals are known in the art as surround-type signals (see column 4, lines 56-63 of Gates).

Regarding **Claim 20**, Figure 8 also illustrates a group of speakers (118,112,148) that emit the other audio difference signal from the

Art Unit: 2644

right of each passenger (col. 9, lines 4-67). These speakers read on "a second plurality of substantially identical electroacoustical transducers. As noted previously in regards to Claim 18, the audio source supplied to the amplifier of the speaker includes three signals, a sum and two difference signals. The different groups of speakers cited above emit the difference signals, represented as L-R and R-L. These difference signals and their original left and right channel basis signals read on "said first audio signal source comprising a left surround output channel and a right surround output channel". Figure 8 illustrates that the first cited group of speakers (110,120,146) each emit the left reverberant, or L-R, difference signal and the second group of the above cited speakers emit the right reverberant, or R-L, difference signal (col. 4, lines 63-66). This reads on "said first plurality of transducers are for radiating sound waves corresponding to signals corresponding to said left surround output channel and wherein said second plurality of transducers are for radiating signals corresponding to said right surround output channel". As discussed in Claim 18 in regards to the positioning of the speakers, each of the second cited above speakers of the second group are symmetrically positioned opposite of each of the speakers in the above cited first group, centered around the leg compartment areas of the front seats and back seat of the passenger compartment (col. 8, lines 35-48 and col. 9, lines 49-68 and col. 10, lines 1-22). This reads on each of the seats being "positioned substantially identical to, in the direct field of, one of said first plurality of

Art Unit: 2644

electroacoustical transducers and substantially identical to, and in the direct field of, one of said second plurality of electroacoustical transducers".

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

8. **Claims 1, 2, 4-5, and 12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Wiseman (USPN 4042791) in view of Klayman.**

Wiseman discloses a stereophonic headrest. The headrest (10) comprises a central (12) and two angled end pieces (14,16) (col. 1, lines 59-66). The headrest is described as particularly being for an automobile seat (col. 1, lines 13-16). In view of this statement, the backrest (18) and headrest(10) collectively read on "a seat having a seat back". Speakers (48,50) are mounted on opposite ends of the headrest (10), and emit a stereophonic signal (col. 2, lines 12-17 and 23-33). The placement of these speakers (48,50) inside the end portions reads on "an electroacoustical transducer mounted in said seat back". "Stereophonic", by definition involves the transmission of two channels of audio, and the source of the audio for the speakers

Art Unit: 2644

(48,50) is not shown, but is inherently connected to the speaker in some manner. Wiseman does illustrate a pair of lead electrical wires (53,55) for coupling volume control knobs (52,53) to the speakers (48,50) (col. 2, lines 29-33). The stereophonic sound source reads on "a first audio source having a plurality of channel signals". The inherent connections to the stereophonic sound source read on "electronic circuitry coupling said first audio source and said electroacoustical transducer".

However, Wiseman does not specify:

- that the audio source includes multiple channels, wherein one is a surround channel
- that this surround channel is connected to the said transducer

As detailed above, Klayman discloses a method for improving the imaging of a sound source. The audio in the system of Klayman involves sum and difference signals that applied to speakers specifically placed around the passengers in a vehicle. Klayman also discloses an embodiment for a theater wherein rear stereophonic left and right signals are produced (col. 6, lines 53-58). The overall number of signals supplied for output, such as for the input to the amplifier (7) in Figure 1, along with the plurality of signals produced for the system of Figure 7 reads on "a first audio source having a plurality of audio channel signals, said plurality of audio channel signals including a surround channel signal". As stated above, the difference signals applied to the left and right speakers.

Art Unit: 2644

(110 and 118, 120 and 112, 146 and 148) are reverberant. The similar versions of these signals for the rear stereophonic signals, $(L-R)_R$ and $(R-L)_R$, are particularly emitted at the behind seating areas (62, 64) (col. 6, lines 47-58). Both of these teachings, in view of the speaker placement of Wiseman, read on "for transmitting said channel signal to said electroacoustical transducer".

To one of ordinary skill in the art at the time the invention was made, it would have been obvious to implement the vehicle speaker system of Wiseman to multiple seats in a vehicle and with the improved imaging circuitry of Klayman. More specifically, the teachings of Klayman provide motivation for emitting the basic difference signals of Figure 8 from the headrest speakers because of the improved transmission to a user's ears, as taught by Wiseman. The teachings of Klayman would also provide motivation for emitting the alternate, rear stereophonic signals of Figure 7 because of the rearward positioning of such speakers as taught by Wiseman. The motivation behind combining the teachings of these two references in such manners would have been the net improvement of the sound received and imaged for each individual user in the audio environment, based on the combination of the nearness and location of such speakers and the qualities of the signals being emitted. This motivation is derived from the relevant teachings of both Wiseman and Klayman.

Regarding **Claim 2**, as detailed above, the speakers (48, 50) of Wiseman are located in ends (14, 16) of the headrest (10), which reads on "said seat back comprises a headrest, and wherein said

Art Unit: 2644

electromechanical transducer is mounted in said headrest" (col. 2, lines 23-26 of Wiseman).

Regarding **Claim 4**, Wiseman clearly illustrates the use of two transducers (48,50) for emitting the output of the audio system (col. 2, lines 23-26). This reads on "a second electroacoustical transducer". As detailed above in regards to Claim 1, the system of Klayman involves difference signals as two input signals, and these signals are referred to as "left difference" and "right difference" signals (col. 4, lines 63-66). This reads on "said plurality of audio channels includes a right surround channel signal and a left surround channel signal". Observing the seat and vehicle interior of Figure 8 of Klayman, it can be seen that the L-R, or left reverberant signal is emitted from speakers positioned to the left of the forward facing positions of passengers in the vehicle compartment and the R-L difference signal, or right reverberant audio signal is emitted from speakers positioned to the right of the forward facing positioned of passengers in the vehicle compartment. In view of the teachings of both references and the left and right positioned speakers of Wiseman, the inherent signal connections for the left and right audio signals of the left and right speakers reads on "said electronic circuitry is adapted to transmit said left surround channels signal to said first transducer and said right channel signal to said second transducer". As can be seen in Figure 1 of Wiseman, each of the speakers (48,50) are positioned on opposite sides of a seat occupant's head position, ready to be adaptable coupled to a user's head, which reads on "said

first electroacoustical transducer is positioned to one side of a normal head position of an occupant of said automobile seat" and the other transducer being positioned "to an other side of said normal head position" (col. 2, lines 43-47 of Wiseman).

Regarding **Claim 5**, the sum and difference signals produced in the system of Klayman for the embodiment of Figure 8 are specifically combined with the sum channel signal (L+R) in order to lower the "apparent position of the image of the direct field sound source and decreases dominance of the direct sound field sound source". Specifically, this "decreasing of dominance" of the direct audio signal means that the images produced by the reverberant difference signals are increasingly perceivable. Thus, the separation, based on the respective directions associated with the two signals, that exists in the two difference signals would be more prominent in the overall sound field, which is reflected by the statement of Klayman that such a modification "provides a greatly improved realism and apparent increase in realistic positioning of both the direct and reverberant sound fields" (col. 9, lines 39-43). This circuitry that performs this electrical addition of signals reads on "signal processing circuitry for modifying said left surround channel and said right surround channel to increase the perceived audible separation between sound radiated by said first transducer and sound radiated by said second transducer" (col. 3, lines 31-38).

Art Unit: 2644

Regarding **Claim 12**, the headrest of Wiseman is described as particularly being for an automobile seat, which reads on "said seat is an automobile seat" (col. 1, lines 13-16 of Wiseman).

9. **Claims 1, 3-6, 9, 12, and 22** are rejected under 35 U.S.C. 103(a) as being unpatentable over Boinais in view of Klayman.

As detailed above, Boinais discloses a vehicle seat with built-in, upward facing speakers. The structure of the seat reads on "a seat having a seat back" and the two speakers mounted therein read on "an electroacoustical transducer mounted in said seat back". Boinais also discloses that the audio system may be used with a hands-free telephone, radio, cassette player, or optical disc player (See final paragraph, second page). The electrical connections that would have been necessary to connect these devices with the speaker arrangement of the vehicle seat read on "electronic circuitry coupling said first audio source and said electroacoustical transducer for transmitting said surround channel signal to said electroacoustical transducer".

While Boinais discloses multiple different audio sources, it is not specified:

- that one of the sources includes multiple channels, one of which is connected to the said transducer

As also detailed above, Klayman discloses a method for improving the imaging of a sound source. The audio in the system of Klayman involves sum and difference signals that are applied to speakers specifically placed around the passengers in a vehicle. Klayman also

Art Unit: 2644

discloses an embodiment for a theater wherein rear stereophonic left and right signals are produced (col. 6, lines 53-58). The overall number of signals supplied for output, such as for the input to the amplifier (7) in Figure 1, along with the plurality of signals produced for the system of Figure 7 reads on "a first audio source having a plurality of audio channel signals, said plurality of audio channel signals including a surround channel signal". Similar versions of these signals for the rear stereophonic signals, $(L-R)_R$ and $(R-L)_R$, are particularly emitted at the behind seating areas (62, 64) (col. 6, lines 47-58). Both of these teachings, in view of the speaker placement of Wiseman, read on "for transmitting said channel signal to said electroacoustical transducer".

To one of ordinary skill in the art at the time the invention was made, it would have been obvious to implement the vehicle speaker system of Boinais to multiple seats in a vehicle and with the improved imaging circuitry of Klayman. More specifically, the teachings of Klayman provide motivation for emitting the main difference signals of Figure 8 from the headrest speakers because of the improved transmission to a user's ears, as taught by Wiseman. The teachings of Klayman would also provide motivation for emitting the alternate, rear stereophonic signals of Figure 7 because of the rearward positioning of such speakers as taught by Wiseman. The motivation behind combining the teachings of these two references in such manners would have been the net improvement of the sound received and imaged for each individual user in the audio environment, based on the

combination of the nearness and location of such speakers and the qualities of the signals being emitted. This motivation is derived from the relevant teachings of both Wiseman and Klayman.

Regarding **Claim 3**, Figure 1 of Boinais illustrates that the speakers (8) in the system are arranged to project sound in an upward direction, which reads on "said electroacoustical transducer is mounted along an axis to radiate upwardly from said seat back" (see paragraph that begins "In preferred modes").

Regarding **Claim 4**, Boinais clearly illustrates the use of two transducers (8) for emitting the output of the audio system (Figure 1). This reads on "a second electroacoustical transducer". As detailed above in regards to Claim 1, the system of Klayman involves difference signals as two output signals, and these signals are referred to as "left difference" and "right difference" signals (col. 4, lines 63-66). This reads on "said plurality of audio channels includes a right surround channel signal and a left surround channel signal". Observing the seat and vehicle interior of Figure 8 of Klayman, it can be seen that the L-R, or left reverberant signal is emitted from speakers positioned to the left of the forward facing positions of passengers in the vehicle compartment and the R-L difference signal, or right reverberant audio signal is emitted from speakers positioned to the right of the forward facing positioned of passengers in the vehicle compartment. In view of the teachings of both references and the left and right positioned speakers of Boinais, the inherent signal connections for the left and right audio signals

Art Unit: 2644

of the left and right speakers reads on "said electronic circuitry is adapted to transmit said left surround channels signal to said first transducer and said right channel signal to said second transducer". As can be seen in Figure 2 of Boinais, each of the speakers in the vehicle seat audio system are positioned on opposite sides of a seat occupant's head position, which reads on "said first electroacoustical transducer is positioned to one side of a normal head position of an occupant of said automobile seat" and the other transducer being positioned "to an other side of said normal head position".

Regarding **Claim 5**, the sum and difference signals produced in the system of Klayman for the embodiment of Figure 8 are specifically combined with the sum channel signal (L+R) in order to lower the "apparent position of the image of the direct field sound source and decreases dominance of the direct sound field sound source". Specifically, this "decreasing of dominance" of the direct audio signal means that the images produced by the reverberant difference signals are increasingly perceivable. Thus, the separation, based on the respective directions associated with the two signals, that exists in the two difference signals would be more prominent in the overall sound field, which is reflected by the statement of Klayman that such a modification "provides a greatly improved realism and apparent increase in realistic positioning of both the direct and reverberant sound fields" (col. 9, lines 39-43). This circuitry that performs this electrical addition of signals reads on "signal processing circuitry for modifying said left surround channel and said right

Application/Control Number: 09/532,907

Art Unit: 2644

surround channel to increase the perceived audible separation between sound radiated by said first transducer and sound radiated by said second transducer" (col. 3, lines 31-38).

Regarding **Claim 6**, the disclosure of Boinais concludes with a list of other audio devices, aside from a telephone, that may also be connected with the audio system, including a car radio, cassette player, and CD player. This reads on "a second audio source, coupled to said circuitry for transmitting audio signals from said second source to said first transducer and said second transducer" (see the final paragraph of page 2, which begins "Loudspeakers 8 are preferably connected".

Regarding **Claim 9**, please refer to the like teachings of Claim

6.

Regarding **Claim 12**, the title of the invention of Boinais specifically notes that the illustrated seat is the seat of a vehicle, which reads on "said seat is an automobile seat" (see title in current translation). Regarding **Claim 22**, please refer above to the like teachings of Claims 1, 4, 6, and 12.

10. **Claims 7-8, 10-11, 23, and 25-28** are rejected under 35

U.S.C. 103(a) as being unpatentable over Boinais in view of Klayman as

applied above, and further in view of Yoshino et al (USPN 4691361).

Hereafter, "Yoshino et al" will simply be referred to as "Yoshino".

As detailed above, Boinais discloses a vehicle seat with built-in, upward-facing speakers. Klayman discloses a method for improving

Art Unit: 2644

the imaging of a sound source to multiple users in multiple sound fields in the passenger compartment of a vehicle.

Yet, Boinais in view of Klayman does not specify:

- that the first audio source is transmitted to the first and second transducers in the absence of a signal from the second audio source
- that the first audio source is muted from the first and second transducers in the presence of a signal from the second audio source

Yoshino discloses a speaker changeover device for enabling multiple audio sources to be used with the same set of output speakers. The system of Yoshino comprises a main changeover control circuit (4) which includes a ready condition monitor circuit (43) that monitors the condition of each of the input audio equipments (1a-1d) (col. 1, lines 56-65). The input status signals of the audio devices (1a-1d) are monitored in order and the changeover circuit (3) is altered to output the audio source that first sends a ready condition signal during a monitoring cycle (col. 1, lines 65-68 and col. 2, lines 1-2). Thus, while multiple audio sources may be present, only one is outputted in this arrangement, which means that the other sources are effectively muted. Yoshino lists possible input audio devices as being a car radio, a car stereo, a car television, and a personal wireless telephone (col. 1, lines 48-50). From these teachings, depending on the order of connection, that when one audio source is present, it will always be output from the system, but when

Art Unit: 2644

two sources are present, one will be output instead of the other, based on the order in which the ready signals are associated with the input devices (col. 1, lines 65-68 and col. 2, lines 1-2). This combination of multiple input sources, in view of the previous teachings of Boinais in view of Klayman reads on circuitry for transmitting the left and right channel signals of the first audio source to the respective speakers "in the absence of a signal from said second source" and to mute the left and right channel signals from the first audio source "in the presence of a signal from said second source".

To one of ordinary skill in the art at the time the invention was made, it would have been obvious to modify the audio system of Boinais in view of Klayman by adding the speaker changeover device of Yoshino. The motivation behind such a modification would have been that multiple audio source would have been able to make use of the same set of audio speakers, which would have decreased the connection circuitry and number of audio components in the already space restricted environment of a vehicle. Boinais mentions that multiple audio sources may be used with the vehicle seat speaker system, and Yoshino discloses the particular circuitry for making use of multiple audio sources with the same speaker system possible.

Regarding **Claim 8**, the system of Boinais is specifically intended for use with hands-free telephones, which reads on "the second audio signal source is a telephone". Yoshino also discloses a "personal wireless telephone" (col. 4, lines 8-9).

Regarding **Claim 10**, please refer to the like teachings of Claim 7. Regarding **Claim 11**, please refer to the like teachings of Claim 8.

Regarding **Claim 23**, please refer to the like teachings of Claim 7.

Regarding **Claim 25**, Yoshino also discloses that the changeover system may be used to concurrently connect two different audio sources to two different output transducers (col. 3, lines 50-60). This reads on "wherein said second audio source is coupled exclusively to said one of said plurality of transducers". As can be seen in Figure 1 of Boinais, the speakers of the audio system are positioned in a seat, and Figure 8 of Klayman illustrates that the driver's seat position in the vehicle has its own set of left and right speakers. In combination, these teachings read on "wherein said one of said plurality of transducers is positioned in a driver's seat".

Regarding **Claim 26**, please refer to the like teachings of Claims 23 and 24.

Regarding **Claim 27**, please refer to the teachings of Klayman, which as can be seen in Figure 8, disclose multiple sets of transducers and thus reads on "a second plurality of transducers". Please also refer to the teachings of Yoshino, which disclose that all or individual speakers may be simultaneously connected to one or more audio sources, as discussed in regards to Claim 24. These teachings of Yoshino read on "said second audio signal source is coupled to one of said second plurality of transducers".

Application/Control Number: 09/532,907

Art Unit: 2644

Regarding **Claim 28**, please refer to the like teachings of Claim 7, noting the various combination of input sources in the system of Yoshino.

11. **Claims 19 and 21** are rejected under 35 U.S.C. 103(a) as being unpatentable over Klayman as applied to claims 18 and 20 above, and further in view of Yamada (USPN 4329544).

As detailed above, Klayman discloses a method for improving the imaging of a sound source to multiple users in multiple sound fields in the passenger compartment of a vehicle.

Klayman does not specify:

the use of a single equalizer to couple the output transducers to the audio source
Yamada discloses the use of equalizers for each of the left and right channel speakers in the audio system of a vehicle. The system of Yamada is specifically designed to be capable of modifying the left and right channel audio signals so that the sound field would have sounded wider than the actual space inside the vehicle passenger compartment (col. 9, lines 31-48). Figure 4 of Yamada illustrates the relevant processing of the left and right channel audio signals, wherein both left and right channel signals (L,R) are passed through equalizers (10,11) before being further modified by the remainder of the system. This use of equalizers, in view of the teachings of Klayman that involve the passing of the same signal to multiple

Art Unit: 2644

speakers, reads on "said plurality of electroacoustical transducers are coupled to said audio signal source by a single equalizer".

To one of ordinary skill in the art at the time the invention was made, it would have been obvious to include the equalizing and signal-processing scheme of Yamada in the audio system of Klayman. The motivation behind such a modification would have been that the signal processing scheme of Yamada would have been able to enhance the imaging quality of the emitted audio of the system of Klayman by electronically adjusting the audio beyond the physical limitations of the speaker positions in the system of Klayman. The signal-processing scheme of Yamada would have also been capable of adding reverberation effects to the emitted audio, which would have also improved upon the reverberation part of the audio scheme of the system of Klayman.

Regarding **Claim 21**, Yamada teaches the use of separate equalizers (10,11) for each of the audio channels in the system (col. 3, lines 46-52). This concept, in view of the teachings of Klayman, reads on "said first plurality of transducers is coupled to said audio signal source by a single equalizer and wherein said second plurality of electroacoustical transducers are coupled to said audio signal source by a single equalizer".

12. **Claims 29-31** are rejected under 35 U.S.C. 103(a) as being unpatentable over Imai (USPN 5129004) in view of Klayman.

Imai discloses an automotive multi-speaker audio system with particular timings between speaker outputs, as well as various

Application/Control Number: 09/532,907
Art Unit: 2644

physical positionings of the speakers. The embodiment shown in Figures 14, 15, and 16 includes the use of a single speaker (316RL) located in the center console (col. 9, lines 57-60). The overall system reads on "A vehicle sound system" (col. 4, lines 12-21). The console illustrated in Figure 15 reads on "a console separating first and second front seats". The signal source (111) reads on "an audio signal source" (col. 4, lines 15-16). The speaker (316RL) reads on "an electroacoustical transducer mounted on said rear panel" (col. 9, lines 1-4 and 57-60). Connections, such as those shown in Figure 30, illustrate the concept of such a speaker being "coupled to said audio signal source" (col. 14, lines 50-64).

Imai discloses a console but does not specify:

that the console has a rear behind first and second said front seats
a rear panel facing said rear area not occupied by the
console

However, the examiner respectfully submits that center console arrangements, including those that do not extend beyond the front seats of a vehicle are substantially well known in the art. Klayman discloses an embodiment with a center console between the seats of the driver and front passenger of a vehicle, but with the existence of space for the feet of another passenger (Figure 8 and col. 7, lines 60-67 and col. 10, lines 10-15). Speakers (118,120) are illustrated as being mounted on the exterior surface of said console (122). The space for the rear passenger's legs and feet reads on "a rear behind

Art Unit: 2644

first and second said front seats". A back line is clearly shown in Figure 8 for the back of console (122) (col. 7, lines 60-67). This line, along with the well known aspects of physically implementing such a component, reads on "a rear panel facing said rear". Again, the fact that Imai discloses the center speaker (316RL) as being mounted on a center console, in view of these teachings of Klayman, reads on the speaker being "mounted on said rear panel".

To one of ordinary skill in the art at the time the invention was made, it would have been obvious to involve a space behind the center console and a corresponding rear panel on the console as taught by Klayman into the teachings of Imai. The motivation behind such a modification would have been that such a physical implementation would have enabled the center speaker of Imai to be oriented and unobstructed in the illustrated manner of Figure 14. It would have also enabled a person to sit in the rear of the vehicle, as is taught particularly by Klayman. A center device with dimensions equivalent that of well-known consoles would have otherwise prevented a rear center passenger from being seated naturally in the space. This motivation is based on the teachings and illustrations of Imai and Klayman, along with knowledge that would have been available to one of ordinary skill in the art of vehicle compartments.

Regarding **Claim 30**, Imai discloses that the center speaker (316RL) has an axis oriented along the central axis of the compartment (col. 90, lines 19-22). Figures 14 and 15 illustrate the particular orientations of the main speakers (316), which contrast the upward

Art Unit: 2644

facing speakers (323) (col. 9, lines 46-52). The respective orientation of the other speakers (316) infers that each is oriented in a rearward-facing manner. The positioning of each of these speakers is suggested to establish a good acoustical ambience in front of each of the positions in the vehicle (col. 9, lines 41-45). Collectively, these teachings read on "said electroacoustical transducer is constructed and arranged to radiate sound predominantly toward said rear".

Regarding **Claim 31**, Klayman discloses the concept of having a center, or monaural signal (L+R) signal emitted by particular speakers or in combination with other speakers (col. 16-20 and col. 9, lines 7-38). As can be seen in Figure 8, each of the passengers receives a narrow center channel signal from a local speaker 114,116,140,142) except for the rear, center passenger (P3) (col. 7, lines 53-58 and col. 9, lines 49-53). Figure 11 of Imai teaches that this same mixture of signals may be used with left and right channel signal, wherein said mixed signal is emitted from a centrally positioned speaker in reference to a user's position (col. 6, lines 52-64). In combining a rearward facing, center speaker between the two systems, it is respectfully submitted that it would have been obvious to one of ordinary skill in the art at the time of the invention to emit a center (L+R) signal from this centrally located speaker. Figure 11 of Imai, in view of the teachings of Klayman provides the requisite motivation for combination of left and right signals being emitted from a speaker located between left and right signals, such as those

Art Unit: 2644

present on the rear doors in the system of Klayman. In terms of Figure 8 of Klayman, the motivation would have also been the benefit provided to the rear center passenger; Klayman discloses that this passenger (P3) obtains this signal from a combination of the two back (L+R) speakers (140,142), but the other two rear passengers obtain such a signal from speakers located in the relative direct front and rear of their heads (col. 10, lines 1-15). Providing a (L+R) channel in a center console speaker would have permitted such a channel to be heard in a relatively direct front location for the rear center passengers as well. This would have also prevented improperly perceived directionality cause by a center passengers head being closer to either of the left or right pairs of the narrow pattern speakers (114,116,140,142). This motivation is derived from the teachings of Klayman and Imai, as well as concepts of perceived directionality of sound that would have been apparent to one of ordinary skill in the art at the time of the invention.

Response to Arguments

13. Applicant's arguments with respect to claims 1-28 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

14. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Giglio et al (USPN 5765314) discloses a seat with headrest mounted, surround speakers (Figure 6).

Persson (SE 8204930 A) discloses a headrest mounted speaker system, wherein the speakers are directed upwards.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Andrew Graham whose telephone number is 703-308-6729. The examiner can normally be reached on Monday-Friday, 8:30 AM to 5:00 PM (EST).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Bill Isen can be reached on (703)305-4386. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Art Unit: 2644

Andrew Graham

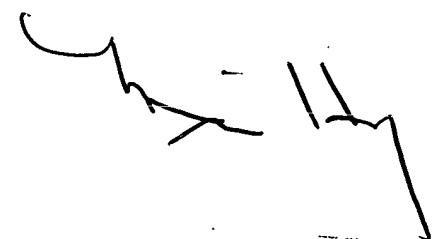
Examiner

A.U. 2644

Ag

ag

April 18, 2004



MiNSUN OH HARVEY
PRIMARY EXAMINER